



MODIS Reflective Band Characterization



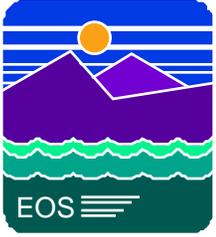
October 22, 1997



Outline



- Introduction
- Reminders, Concerns and Alerts
- Test and Data Overview
- Radiometry Issues
 - SWIR Features
 - Linearity/Non-linearity
 - Uncertainties
- Other PFM Instrument Characteristics
 - Spectral, Spatial, Polarization
- Band by Band Summary - Background Materials



Introduction

Goals and Objectives



- Provide Instrument Characterization Status Update
- Acquire feedback from Science Team
 - consensus on some key decisions
 - Handling of SWIR features in algorithm
 - Approach to Linear or Nonlinear Algorithm decision



Introduction Caveats - 1



- Where possible, results checked for consistency with SBRS
 - Generally consistent--open discrepancies will be called out
- Most analysis on Primary electronics, Mirror Side 1
 - observing differences in coefficients and constants, but not behavior
- MODIS is “rich in detail”-- lots of “features” and “glitches” in 40+ Gbytes of data, that must be investigated to establish if they are:
 - significant
 - representative of instrument behavior
 - test equipment or the test methodology



Introduction

Caveats - 2



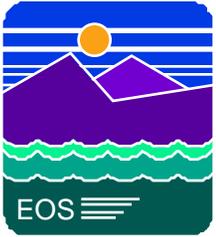
- Despite the volume of data, there are areas where measurements were unsuccessful or inadequate
 - Request Spacecraft Level Special Tests where viable
 - Instrument Temperature Variations
 - Improved Electronic Calibration
 - Will interpolate/extrapolate/use models where necessary
 - all uses of models will be flagged
 - SWIR Response vs. Scan Angle
 - Band 2, 5 Polarization
 - Band 5 Track direction IFOV and MTF



Reminders, concerns and alerts for today - 1



- Results are preliminary
- Transient response may be important for all bands for scenes of medium and high contrast
- Reflectance calibration uses only lab BRF measurement of SD
- SD/SDSM never tested on ground as a system
- SWIR bands have a sensitivity to thermal radiation at 5.3 micrometers
- Second-sample behavior for Bands 5, 6 and 7 is not understood



Reminders, concerns and alerts for today - 2



- SWIR bands have crosstalk
- Briefing linear algorithm, for range $0.3 L_{typ}$ to L_{max}
- L1B communications through MCST web pages
- L2 algorithms sensitive to polarization in Bands 8, 9 and 26 need to be analyzed for sensor behavior
- Full Earth-View aperture surrounding a calibration source never filled to demonstrate calibrations can be achieved with EV “flooded”



Reminders, concerns and alerts for today - 3



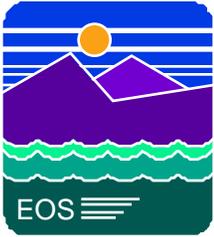
- All L2 algorithms should use actual spectral RSRs
- Validation Plan for L1B immature
- Expect on-orbit surprises
- Improved techniques will be develop for handling current issues (and surprises) with study and learning from on-orbit data



Introduction, References and Documentation



- SBRS material drawn from multiple Internal memoranda, CDRLs, and viewgraph presentations. Key references include
 - Specification Compliance Matrix, CDRL 222 DM VJ50-0474/7
 - T/V Viewgraph packages
 - Trend Analysis Reports Volume 1, Performance Data, CDRL 215A
- Calibration Equations drawn from Level 1B ATBD, V2.0 draft, currently at <http://ltpwww.gsfc.nasa.gov/MODIS/MCST/Home.html>
- Parameters for calibration equations and instrument characterization will be placed on the MCST home page



Introduction

Acknowledgments



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